

REMARKS

This is intended as a full and complete response to the Office Action dated March 12, 2004. Claims 1-17 are pending in the application. Please reconsider the claims pending in the application for reasons discussed below.

Double Patenting

Claims 1-17 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 22-27 of co-pending U.S. Application No. 09/905,513 in view of *Miller et al.* (U.S. 4,801,865).

Claims 1, 9 and 17 recite the limitation of an electro-chemical deposition assembly. However, *Miller et al.* discloses a probe for sensing the moisture content in a porous medium such as soil. Thus, *Miller et al.* is obviously not in the field of the claimed invention and would not have logically commended itself to an inventor's attention in considering his problem relating to electro-chemical deposition. Accordingly, *Miller et al.* is not analogous prior art that can be used in an obviousness rejection. Thus, Applicant respectfully requests withdrawal of the rejection and allowance of claims 1-17.

Claim Rejections- 35 U.S.C. § 103

Claims 1, 3-5, 7-9, 11-13 and 15-17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Dordi et al.* (WO 99/54920) in view of *Miller et al.* (U.S. 4,801,865).

The Examiner states that *Dordi et al.* fails to teach attachment of contact pins by brazing. The Examiner further states that it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified *Dordi et al.* to use brazing to attach the contact pins of *Dordi et al.* because *Miller et al.* teaches the application of contact pins by brazing which would have resulted in a more continuous bond. In response, Applicant respectfully traverses the rejection.

Claims 1, 9 and 17 recite the limitation of an electro-chemical deposition assembly. As discussed above with respect to double patenting, *Miller et al.* is not analogous prior art that can be used in an obviousness rejection. Thus, Applicant

respectfully requests withdrawal of the rejection and allowance of claims 1, 9 and 17, and claims 3-5, 7-8, 11-13 and 15-16 dependent thereon.

Furthermore, claims 1, 9 and 17 recite the limitation of at least one electrical contact pin having a portion brazed in a receiving pocket or slot formed in an annular conductive body. The brazing of the pin in the pocket or slot prevents relative movement between the pin and the annular conductive body in order to provide stability to the pin for contacting a substrate. However, *Dordi et al.* discloses a metal impregnated elastomer ring secured to a stepped surface of a cathode clamp ring such that the metal wires within the elastomer ring can move (i.e., the wires are not rigidly secured or affixed to the clamp ring). Specifically, the metal wires slide relative to each other when the elastomer ring compresses (See, page 15, lines 21-25).

Dordi et al. teaches away from rigidly affixing the metal wires in the elastomer ring to the cathode clamp ring, as accomplished by brazing a portion of a pin in a receiving pocket, since the ability of the metal wires to slide enables the elastomer ring to provide a compliant contacting interface with a substrate, thereby reducing the risk of scratching the substrate (See, page 15, lines 27-30). Further, *Dordi et al.* relies on the non-permanent connection of the pins to the cathode clamp ring to enable compression of the elastomer ring to form a seal. Rigidly affixing the metal wire to the cathode clamp ring would require a substantial reconstruction and redesign of the elements shown in *Dordi et al.* as well as a change in the principle under which the elastomer ring construction was designed to provide the compressible surface for sealing and the compliant contact.

For the foregoing reasons, there is no suggestion or motivation to combine the brazing that is taught in *Miller et al.* with *Dordi et al.* (See, MPEP § 2143.02 “The Proposed Modification Cannot Render the Prior Art Unsatisfactory for its Intended Purpose” and “The Proposed Modification Cannot Change the Principle of Operation of a Reference.”) Therefore, *Dordi et al.* in view of *Miller et al.* fails to teach, show, or suggest an apparatus for electro-chemical deposition that includes at least one electrical contact pin having a portion brazed in a receiving pocket or slot formed in an annular conductive body, as recited in claims 1, 9 and 17, and claims 3-5, 7-8, 11-13 and 15-16 dependent thereon. Accordingly, Applicant respectfully requests withdrawal of the rejection and allowance of claims 1, 3-5, 7-9, 11-13 and 15-17.

Claims 1-2, 7, 9-10, 15 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Crafts et al.* (U.S. 5,807,469) in view of *Miller et al.*

The Examiner states that *Crafts et al.* fails to teach attachment of contact pins by brazing. The Examiner further states that it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified *Crafts et al.* to use brazing to attach the contact pins of *Crafts et al.* because *Miller et al.* teaches the application of contact pins by brazing which would have resulted in a more continuous bond. In response, Applicant respectfully traverses the rejection.

Claims 1, 9 and 17 recite the limitation of an electro-chemical deposition assembly. As discussed above, *Miller et al.* is not analogous prior art that can be used in an obviousness rejection. Thus, Applicant respectfully requests withdrawal of the rejection and allowance of claims 1, 9 and 17, and claims 2, 7, 10 and 15 dependent thereon.

Furthermore, claims 1, 9 and 17 recite the limitation of at least one electrical contact pin having a portion brazed in a receiving pocket or slot formed in an annular conductive body. The brazing of the pin in the pocket or slot provides repeatable, controlled conductance between the pin and the annular conductive body used in the present application to deliver current and voltage to the pin. However, *Crafts et al.* teaches away from providing conductance between cathode contact devices disclosed therein and a cup or a base of a cup that the cathode contact devices are mounted on. Specifically, the cathode contact devices disclosed in *Crafts et al.* do not receive current and voltage from the base of the cup and a dielectric layer (reference character 226 in Figure 9) separates a conductive contact (202) from the base of the cup (3). Rather, the cathode contact devices have a plurality of arms or extending portions that couple to an electrical current supply. Thus, modification of *Crafts et al.* to use brazing to attach the cathode contact devices to the cup or base of the cup would change the principle of operation of *Crafts et al.* Specifically, a conductive attachment between the cathode contact device and the cup would require a substantial reconstruction and redesign of the elements shown in *Crafts et al.* as well as a change in the basic principle under which the *Crafts et al.* construction was designed to operate.

Additionally, there is no indication that the cup or the base of the cup that are disclosed in *Crafts et al.* are conductive bodies since they do not deliver the current to the cathode contact devices. On the other hand, modification of *Crafts et al.* to

use brazing to attach the cathode contact devices to the cup would render *Crafts et al.* unsatisfactory for its intended purpose if the cup was conductive since metal would unsatisfactorily plate to the cup, which would not be separated from the conductive contact by the dielectric layer due to the braze.

For the foregoing reasons, there is no suggestion or motivation to combine the brazing that is taught in *Miller et al.* with *Crafts et al.* Therefore, *Crafts et al.* in view of *Miller et al.* does not teach, show, or suggest an apparatus for electro-chemical deposition that includes at least one electrical contact pin having a portion brazed in a receiving pocket or slot formed in an annular conductive body, as recited in claims 1, 9 and 17, and claims 2, 7, 10 and 15 dependent thereon. Accordingly, Applicant respectfully requests withdrawal of the rejection and allowance of claims 1-2, 7, 9-10, 15 and 17.

Claims 6 and 14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Dordi et al.* – *Miller et al.* combination or *Crafts et al.* – *Miller et al.* combination in further combination with *Woodruff et al.* (U.S. 6,309,524). In response, Applicant respectfully traverses the rejection.

Applicants submit that claims 6 and 14 are patentable over *Dordi et al.* – *Miller et al.* combination or *Crafts et al.* – *Miller et al.* combination in further combination with *Woodruff et al.* based at least on the traversal described above regarding claims 1 and 9, upon which claims 6 and 14 respectively depend. Accordingly, Applicant respectfully requests withdrawal of the rejection and allowance of claims 6 and 14.

New Claims

The references, either alone or in combination, fail to teach, show, or suggest an apparatus for electro-chemical deposition on a substrate that includes a processing cell, an annular conductive body disposed on the processing cell, made of a first metal and having a substrate seating surface formed on a top surface thereof and adapted to support the substrate, the substrate seating surface disposed between a downward angled shoulder of the conductive body and an inner diameter of the conductive body and having at least one pin receiving recess formed therein, at least one electrical contact pin made of a second metal different from the first metal and selected from the group consisting of platinum and platinum alloys, the at least one electrical contact pin having a base portion brazed in the receiving recess and an upper exposed portion extending from the conductive body and adapted to

electrically bias the substrate proximate the perimeter of the substrate, a dielectric covering at least partially encapsulating the conductive body, an electrical lead coupled to a power source and the conductive body through the dielectric covering in order to supply power to the at least one electrical contact pin, a seal coupled to the contact ring proximate the inner diameter and disposed inward of the electrical contact pin, the seal adapted to provide sealing contact with the substrate, an anode disposed on the processing cell, and an electroplating solution supply that fluidly connects the anode and a plating surface of the substrate, as recited in claim 39.

The references, either alone or in combination, fail to teach, show, or suggest an apparatus for electro-chemical deposition on a substrate that includes a processing cell, an annular conductive body in the processing cell, the annular conductive body made of a first metal and having a substrate seating surface formed on a top surface thereof and adapted to support the substrate, wherein the substrate seating surface is disposed between a downward angled shoulder of the conductive body and an inner diameter of the conductive body and having at least one pin receiving recess formed therein, at least one electrical contact pin made of a second metal different from the first metal and selected from the group consisting of platinum and platinum alloys, the at least one electrical contact pin having a base portion brazed in the receiving recess and an upper exposed portion extending from the conductive body and adapted to electrically bias the substrate proximate the perimeter of the substrate, a dielectric covering encapsulating the conductive body, an anode disposed on the processing cell, and an electroplating solution supply that fluidly connects the anode and a plating surface of the substrate, as recited in claim 40.

Conclusion

The references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the apparatus of the present invention. Having addressed all issues set out in the office action, Applicant respectfully submits that claims 1-17 are in condition for allowance, and respectfully requests that the claims be allowed.

Respectfully submitted,



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